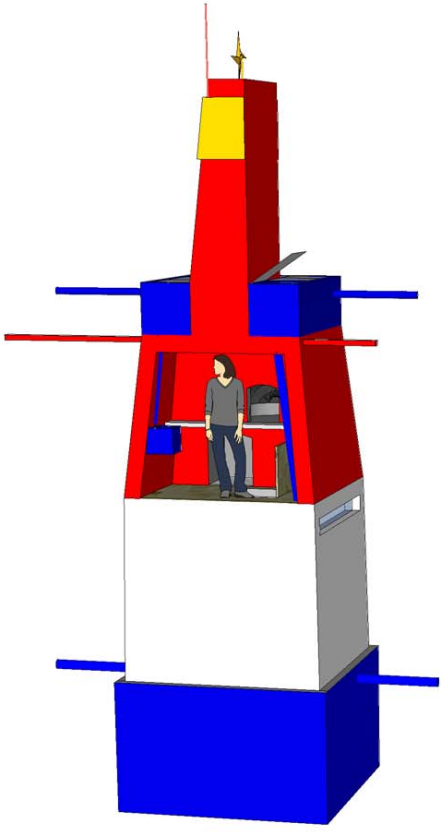
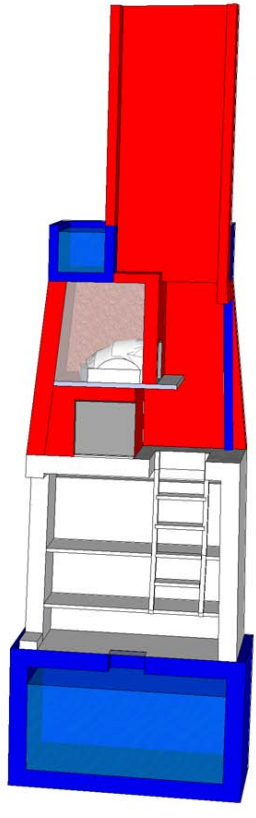
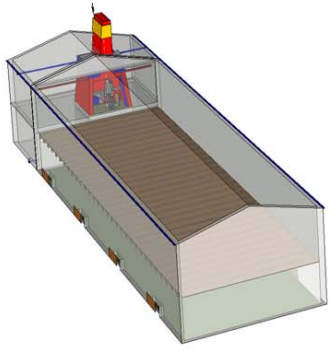
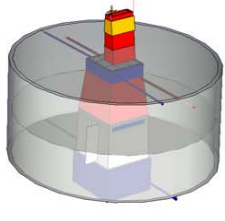
unidade mínima de sobrevivência - ums
minimum survival unit - ums
2009 - 2012









One common question:
what is the smallest possible volume with all the characteristics of a shelter?

One possible answer:
it is the cistern, the fireplace and the oven transformed in a space capsule.
It is the core of the house, but structurally independent. In principle, less vulnerable. Like a cage.

It is not essential to have a pyramidal structure, but it helps stability.

It is not itself a house. It is a pre-house.
In case of emergency, acts as a shelter.
In case of destruction of the house, you can always rebuild the house from the "ums".
Because the "ums" has all the basic functions of life.

The "ums" is like a burrow.
With the versatility and freedom for everyone to make the house they want,
just having as a start a "heart" like the "ums".

In general, each platform of the "ums" corresponds to a particular technology:
cistern, fireplace, oven, chimney, etc.
Hot air from the oven and cool air from the cistern can be used to be injected inside the walls.
Each of these involves their specific craftsmen.
It is for the architect / engineer / designer / builder to prepare these platforms.

I think that will make sense, not only here in the Azores and Cape Verde, but anywhere in the world.
It can and should be adapted to all local materials available, from adobe to plastic, or the obvious concrete.
It can even be made only with recycled materials. It may have different sizes, more or less sophisticated.
I think the NGOs themselves, involved in disaster relief, may have some interest in a thing like this.
Even in a prefab or mobile version.

This is the story for children:
Dona Carolina, with her boyfriend and two children, mark a 3 x 3m field where she makes a 1 x 1m vegetable garden. Next, they make a hole of 0.28 x 0.28 x 0.15m on the ground to build the cistern, then the burrow, the fireplace, the oven, the chimney which includes the cistern 2 (the gravity cistern), the solar panel, the wind generator and, finally, the antenna for communications.
The "ums" is done.
Now, slowly, they will build the house around it.

Final question:
where is the toilet, the loo, the water closet, the bathroom, the sink, the lavatory, the privy, whatever?
It is where it should be: away.
That is, it is either a separate enclosure inside the "ums" or it is outside of it and downstream, not to risk any contamination in the event of catastrophe.

This is not about "the evolution of the house".
This is about "the evolution of the home from the hearth".

If this means something to you, please use it as you want.
I like to spread the idea of the "ums" like a murmur (this is the proper word),
in this case a heart murmur.

Antonio Sena

CONTACT:
cctu.pico.sena@gmail.com

Uma pergunta comum:
qual é o volume mais reduzido com todas as características de um abrigo?

Uma resposta possível:
é a cisterna, a lareira e o forno transformados numa cápsula espacial.
É o centro da casa, mas estruturalmente independente. Em princípio, menos vulnerável.
Como uma gaiola.

Não é essencial ter uma estrutura piramidal, mas ajuda na estabilidade.

Não é uma casa. É uma pré-casa.
Em caso de emergência, funciona como um abrigo.
Em caso de destruição da casa, pode reconstruir-se sempre a casa a partir da "ums".
Porque a "ums" tem todas as funções básicas da vida.

A "ums" é como uma toca.
Com a versatilidade e liberdade de qualquer pessoa fazer a casa que quiser,
tendo apenas como ponto de partida um "coração" como a "ums".

Em geral, cada plataforma da "ums" corresponde a uma tecnologia particular:
cisterna, lareira, forno, chaminé, etc.
Ar quente do forno e ar fresco da cisterna podem ser usados para injectar nas paredes.
Cada uma destas tecnologias envolve o seu técnico específico.
Compete ao arquitecto / engenheiro / designer / construtor preparar essas plataformas.

Penso que fará sentido, não apenas aqui nos Açores e Cabo Verde, mas em qualquer parte do mundo.
Pode ser e deve ser adaptada a todos os materiais locais disponíveis, desde o adobe ao plástico,
ou o óbvio betão.
Pode até ser feito apenas com materiais reciclados.
Pode ter diferentes dimensões e ser mais ou menos sofisticada.
Julgo que as ONGs, envolvidas em situações de desastre, poderão ter interesse numa coisa destas.
Até numa versão pré-fabricada ou móvel.

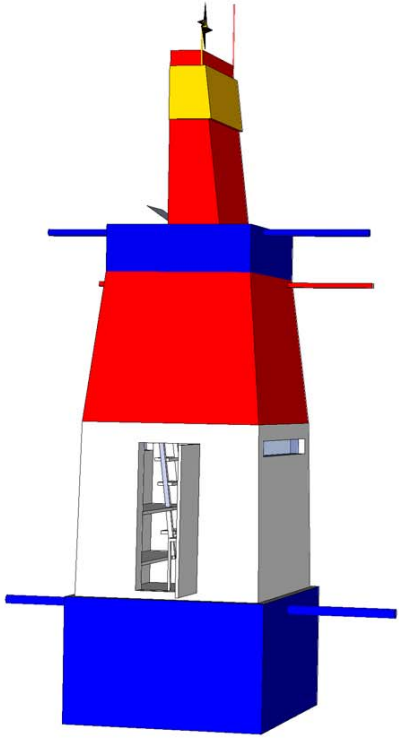
Esta é a história para crianças:
Dona Carolina, com o seu namorado e dois filhos, marca um quadrado de 3 x 3m
onde faz uma horta com 1 x 1m. Depois, faz um buraco no chão com 0.28 x 0.28 x 0.15m
onde constrói a cisterna. Seguem-se a toca, a lareira, o forno, a chaminé (que inclui a cisterna 2),
o painel solar, o gerador eólico e, finalmente, a antena de comunicações.
A "ums" está feita.
Agora, devagar, construirá a casa à sua volta.

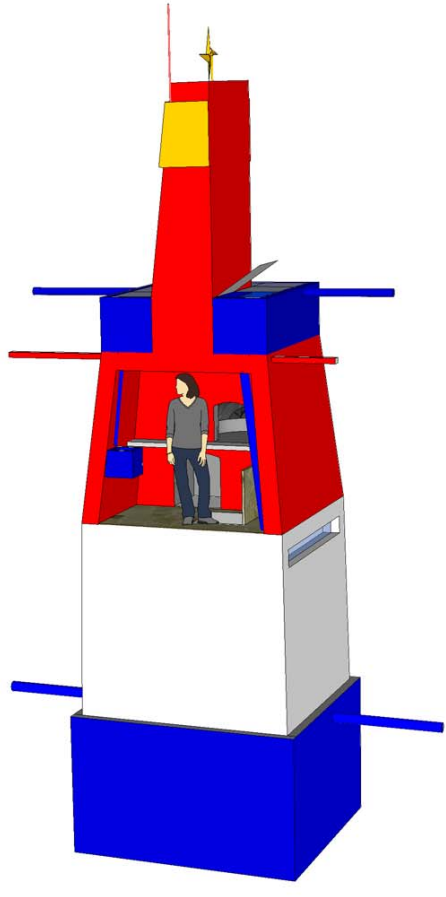
Questão final:
onde está a retrete, a latrina, a privada, a secreta, a sentina, a sanita, a casinha, a casa de banho?
Está onde deve estar: retirada (como o nome indica).
Isto é, ou é um invólucro autónomo no interior da "ums" ou lhe é exterior e a jusante,
para não haver quaisquer contaminações em caso de catástrofe.

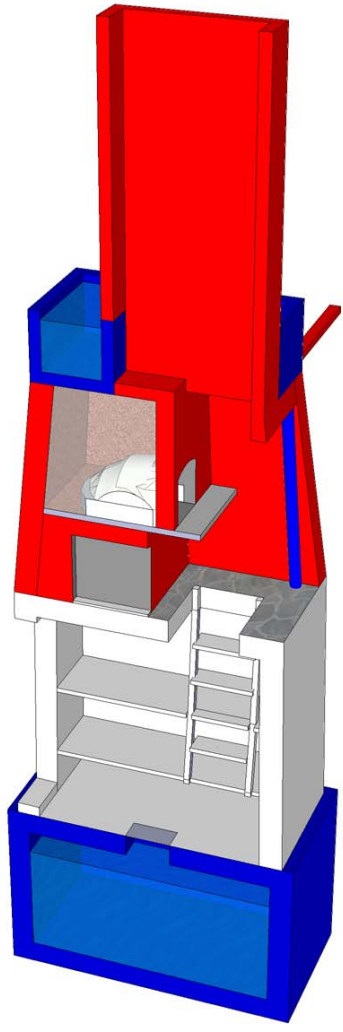
Não se trata da “evolução da casa".
Trata-se da “evolução do lar".

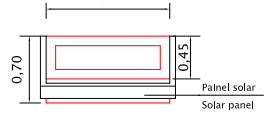
Se isto lhe interessar, por favor use como bem entender.
Gosto de espalhar a ideia da "ums" como um murmúrio (é esta a palavra certa),
neste caso um murmúrio do coração.

Antonio Sena
CONTACTO:
cctu.pico.sena@gmail.com

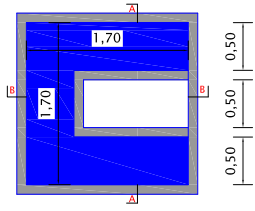




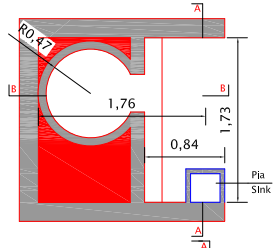




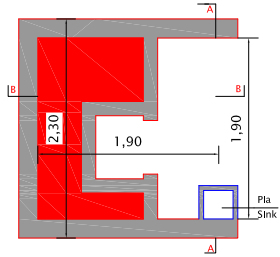
Chaminé
Chimney



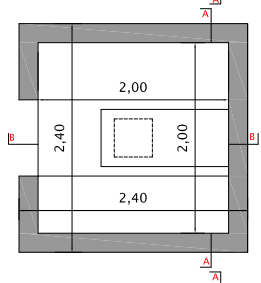
Cisterna 2
Cistern 2



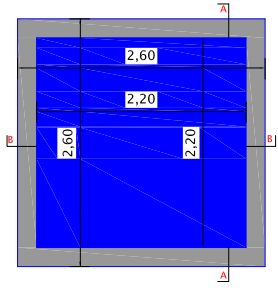
Lar.Forno
Hearth.Oven



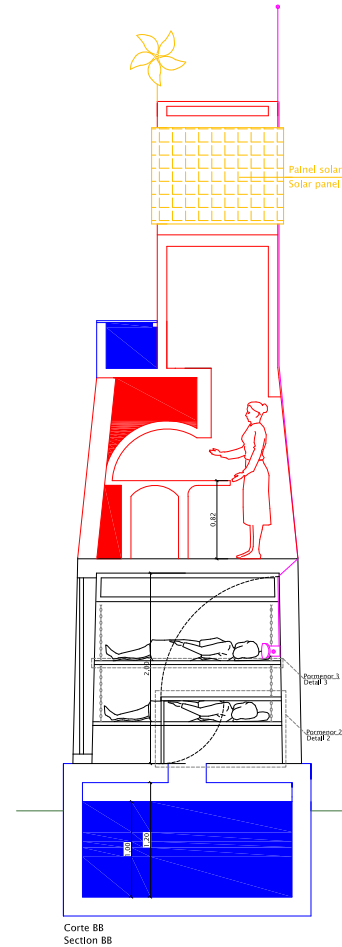
Lar.Lareira
Hearth.Fireplace



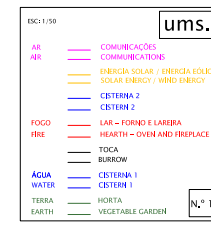
Toca
Burrow

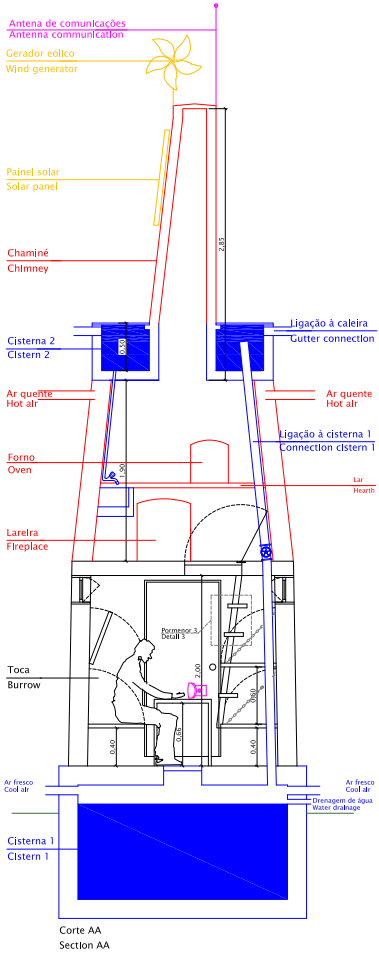


Cisterna 1
Cistern 1

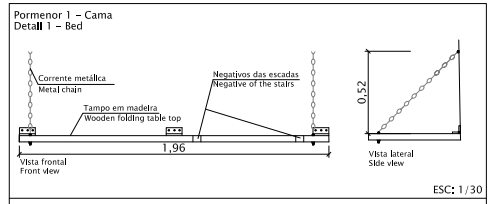


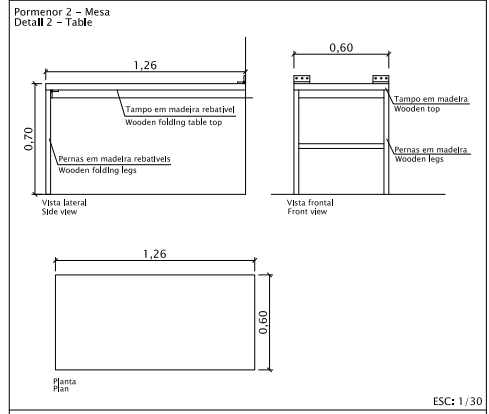
Corte BB
Section BB

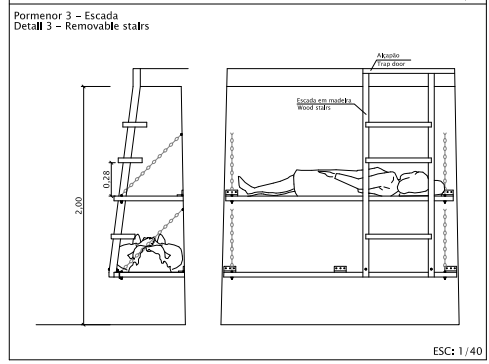


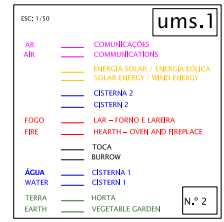


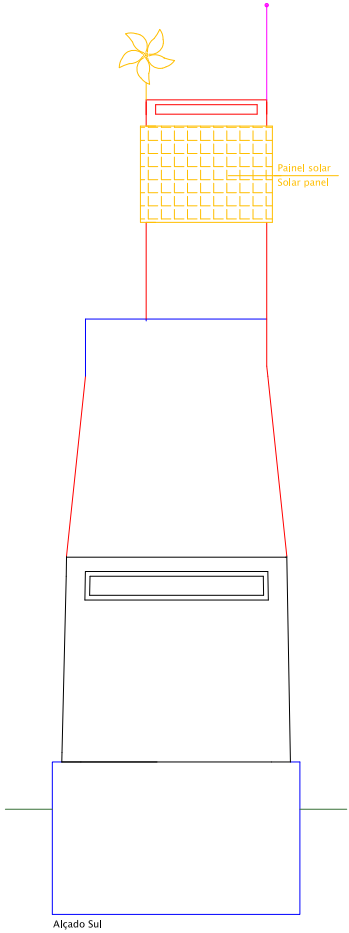
Corte AA
Section AA











Alçado Sul
South elevation

Chaminé
Chimney

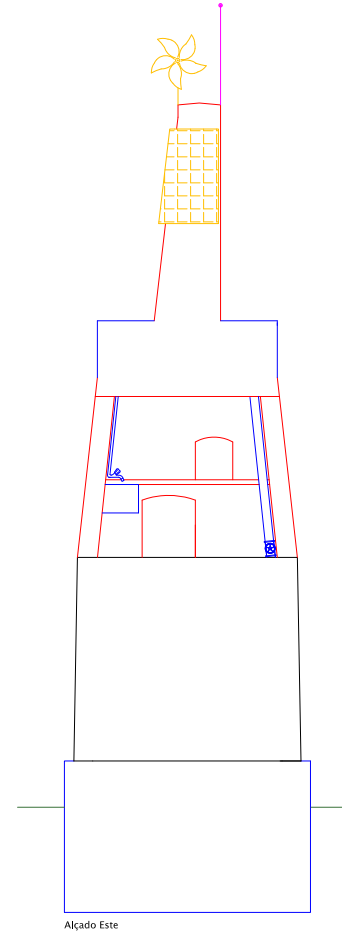
Cisterna 2
Cistern 2

Lar.Forno
Hearth.Oven

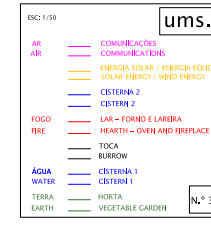
Lar.Lareira
Hearth.Fireplace

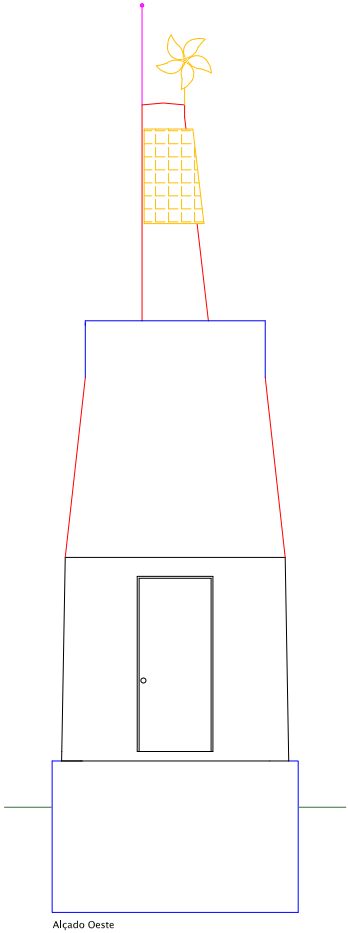
Toca
Burrow

Cisterna 1
Cistern 1



Alçado Este
East elevation





Alçado Oeste
West elevation

Chaminé
Chimney

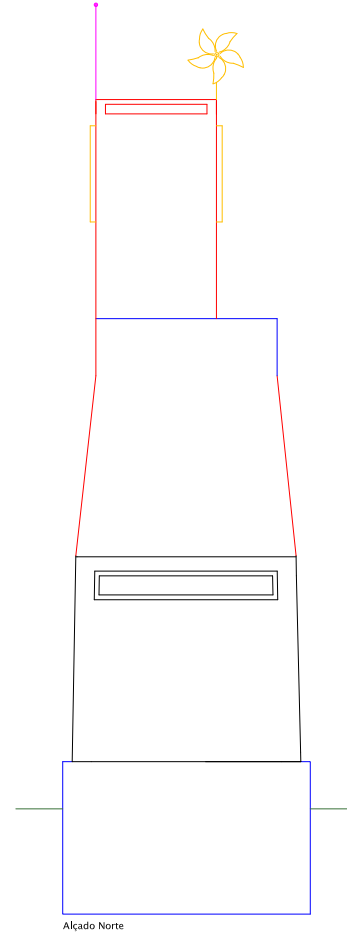
Cisterna 2
Cistern 2

Lar.Forno
Hearth.Oven

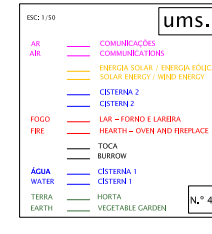
Lar.Lareira
Hearth.Fireplace

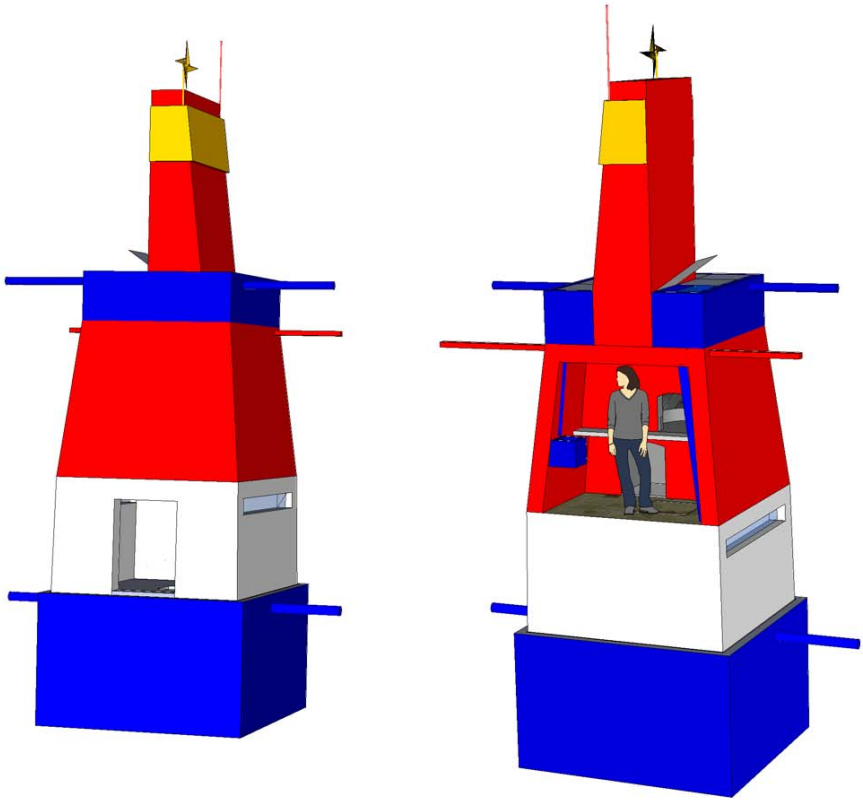
Toca
Burrow

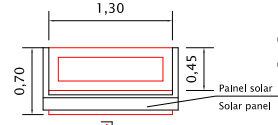
Cisterna 1
Cistern 1



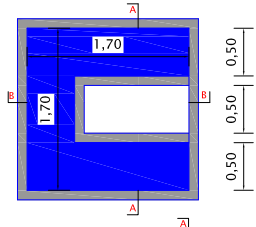
Alçado Norte
North elevation



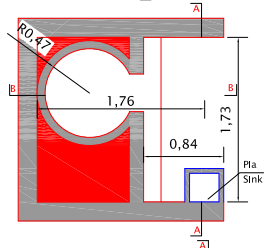




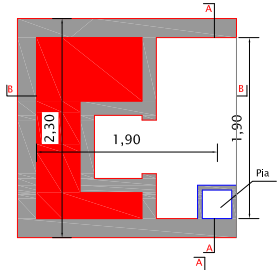
Chaminé
Chimney



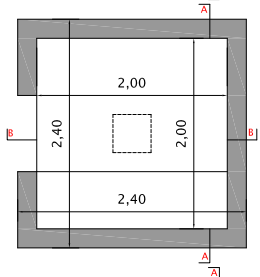
Cisterna 2
Cistern 2



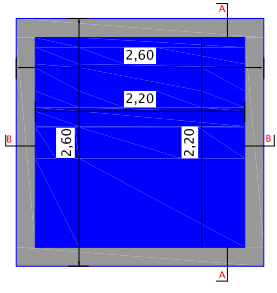
Lar.Forno
Hearth.Oven



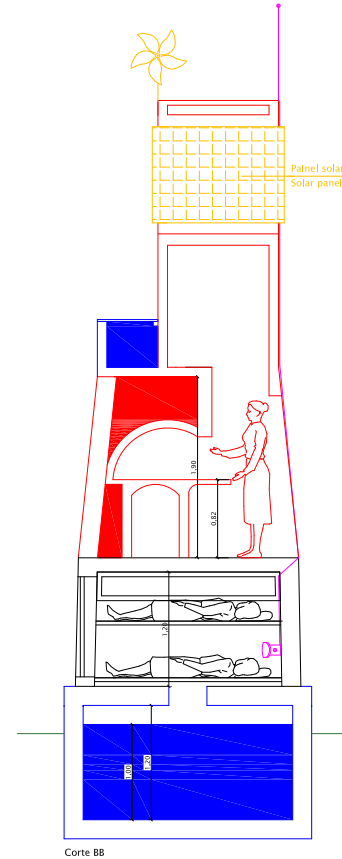
Lar.Lareira
Hearth.Fireplace



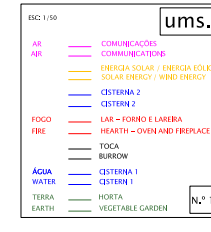
Toca
Burrow



Cisterna 1
Cistern 1



Corte BB
Section BB



Chaminé
Chimney

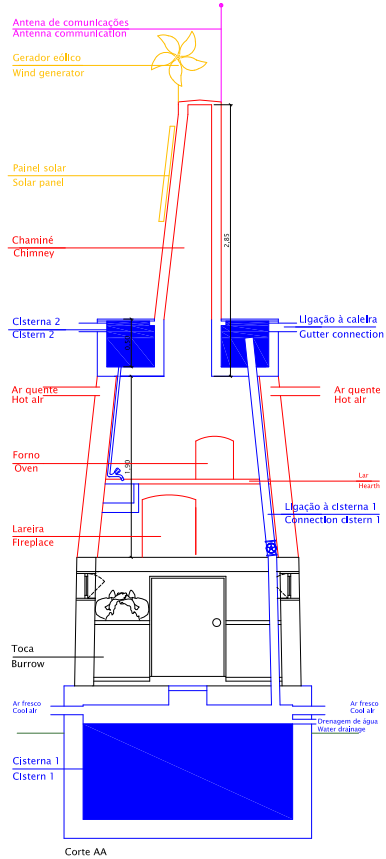
Cisterna 2
Cistern 2

Lar.Forno
Hearth.Oven

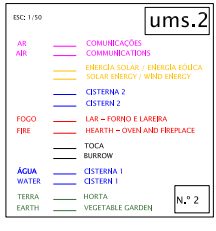
Lar.Lareira
Hearth.Fireplace

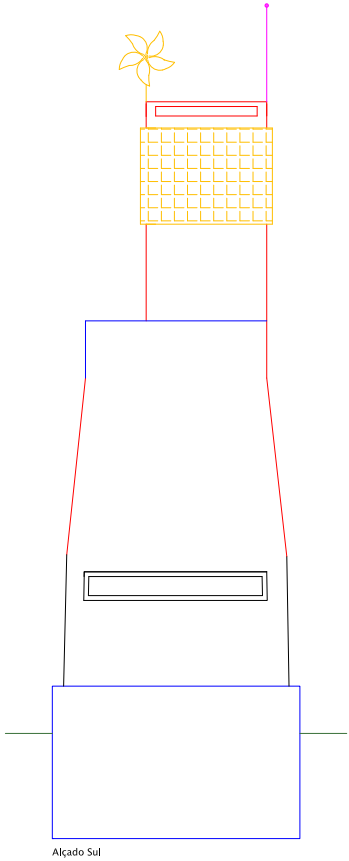
Toca
Burrow

Cisterna 1
Cistern 1



Corte AA
Section AA





Alçado Sul
South elevation

Chaminé
Chimney

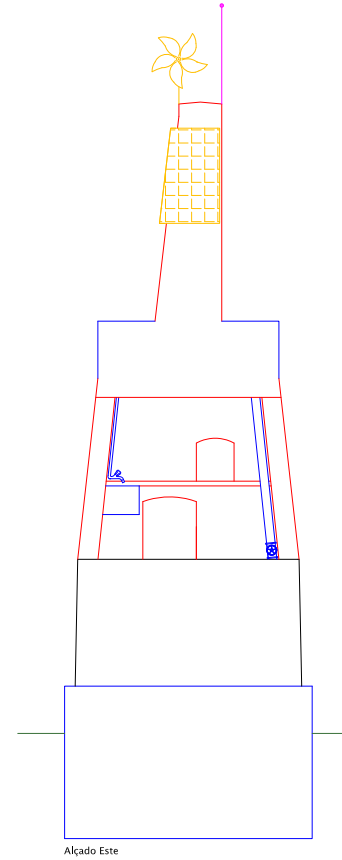
Cisterna 2
Cistern 2

Lar.Forno
Hearth.Oven

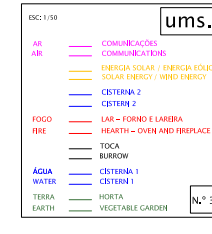
Lar.Lareira
Hearth.Fireplace

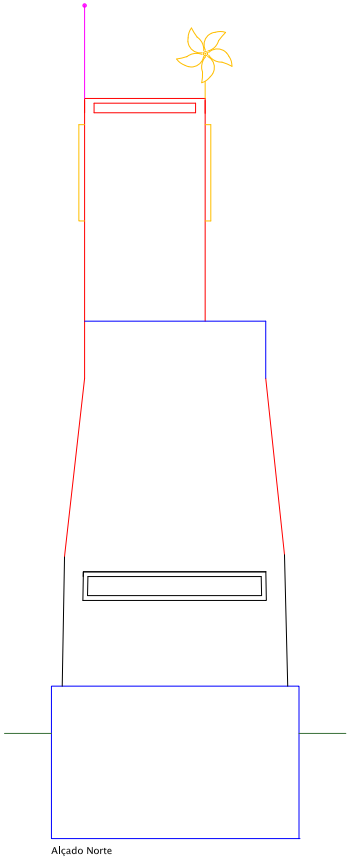
Toca
Burrow

Cisterna 1
Cistern 1



Alçado Este
East elevation





Alçado Norte
North elevation

Chaminé
Chimney

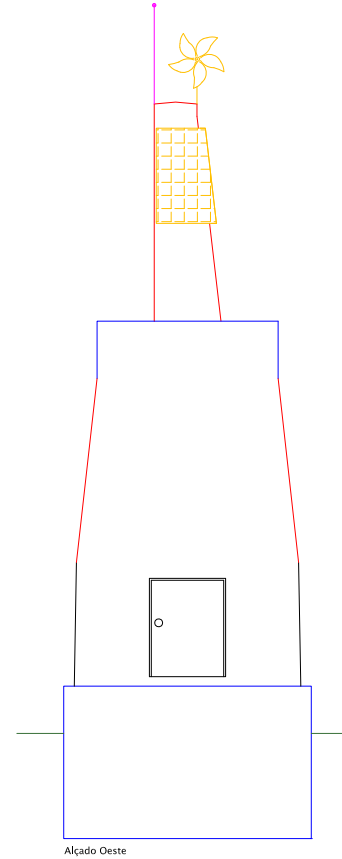
Cisterna 2
Cistern 2

Lar.Forno
Hearth.Oven

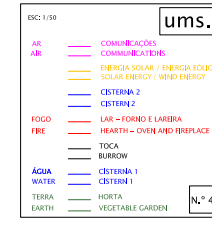
Lar.Lareira
Hearth.Fireplace

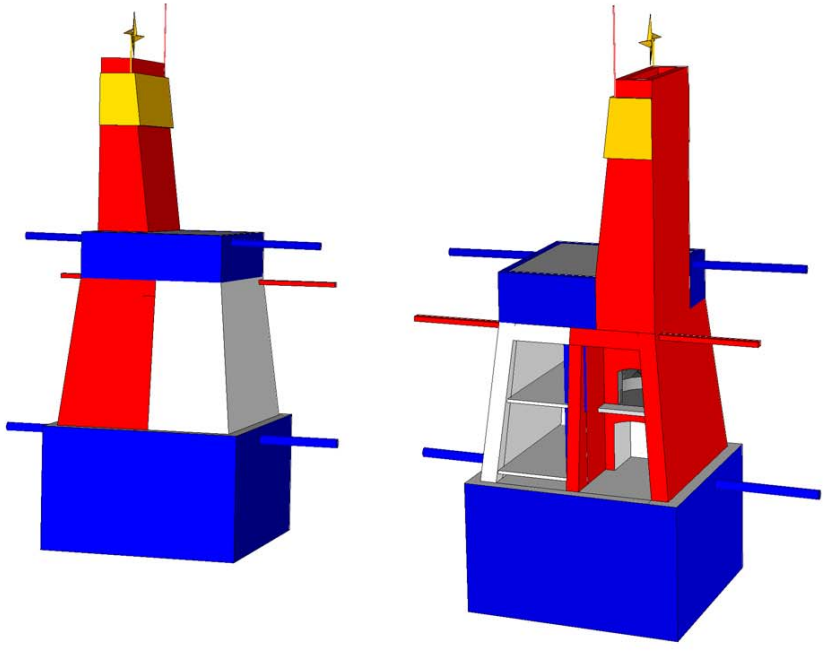
Toca
Burrow

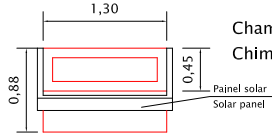
Cisterna 1
Cistern 1



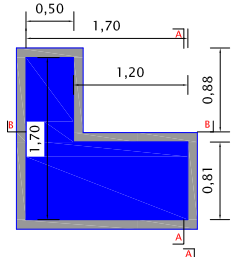
Alçado Oeste
West elevation



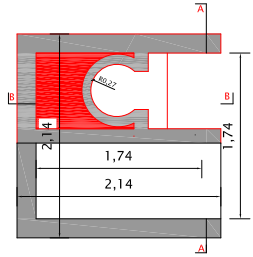




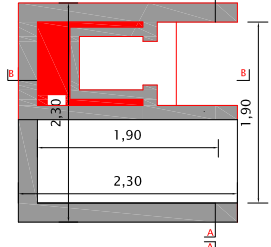
Chaminé
Chimney



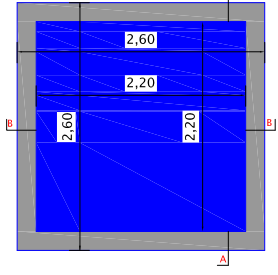
Cisterna 2
Cistern 2



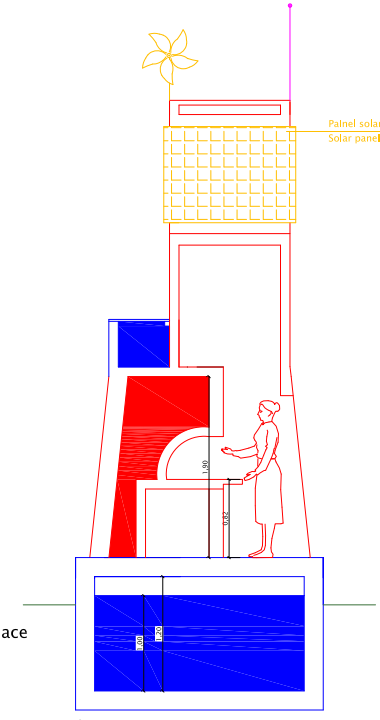
Toca/Lar.Forno
Burrow/Hearth.Oven



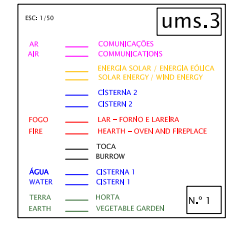
Toca/Lar.Lareira
Burrow/Hearth.Fireplace



Cisterna 1
Cistern 1



Corte BB
Section BB



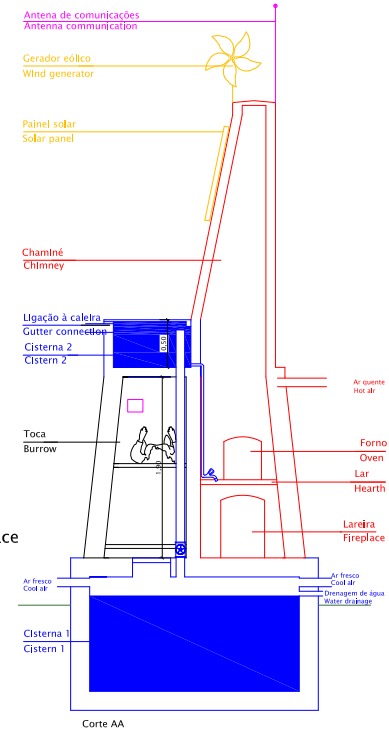
Chaminé
Chimney

Cisterna 2
Cistern 2

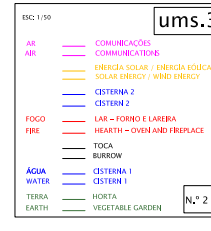
Toca/Lar.Forno
Burrow/Hearth.Oven

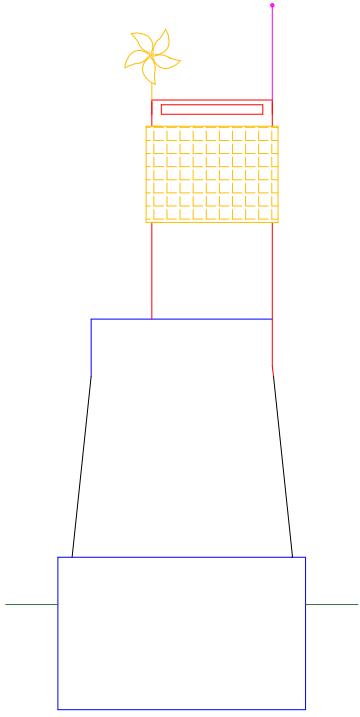
Toca/Lar.Lareira
Burrow/Hearth.Fireplace

Cisterna 1
Cistern 1



Corte AA
Section AA





Alçado Sul
South elevation

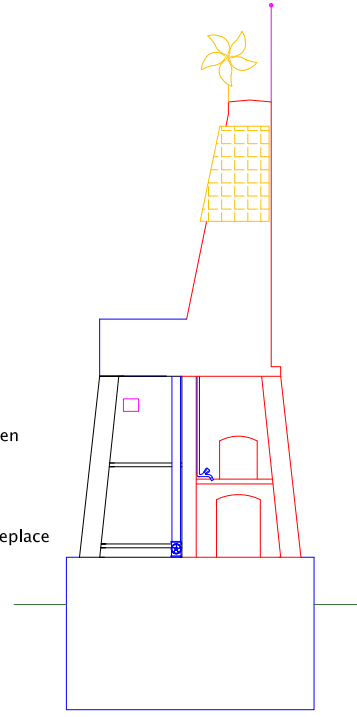
Chaminé
Chimney

Cisterna 2
Cistern 2

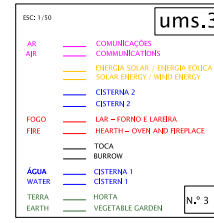
Toca/Lar.Forno
Burrow/Hearth.Oven

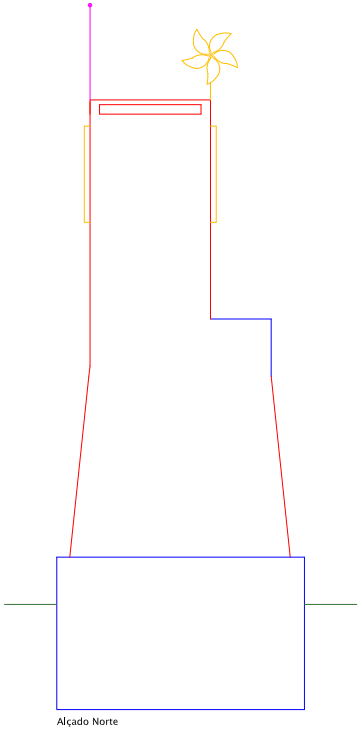
Toca/Lar.Lareira
Burrow/Hearth.Fireplace

Cisterna 1
Cistern 1



Alçado Este
East elevation





Alçado Norte
North elevation

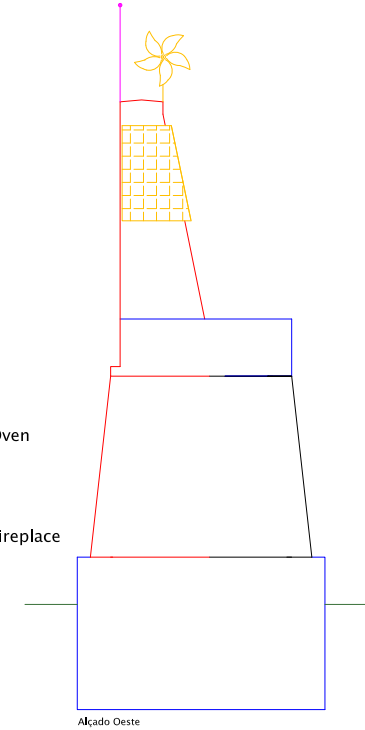
Chaminé
Chimney

Cisterna 2
Cistern 2

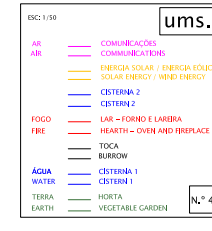
Toca/Lar.Forno
Burrow/Hearth.Oven

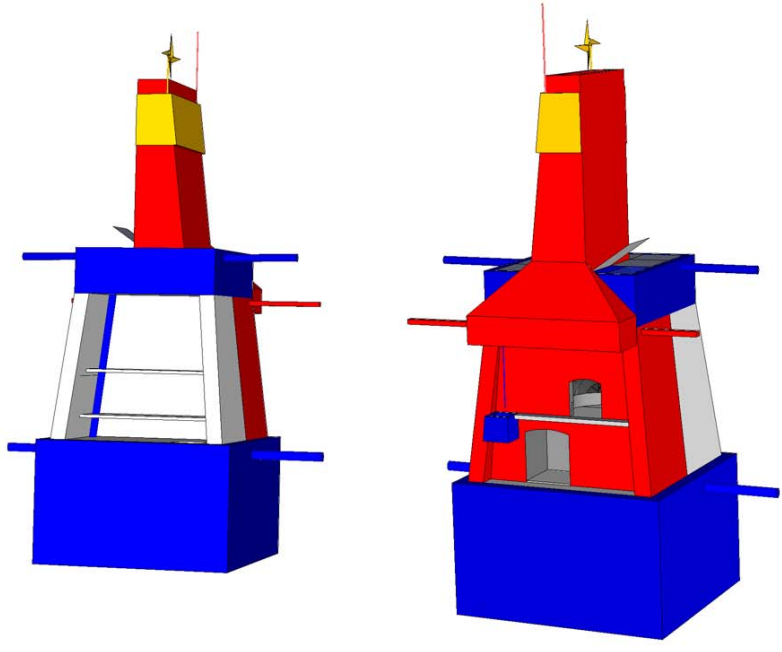
Toca/Lar.Lareira
Burrow/Hearth.Fireplace

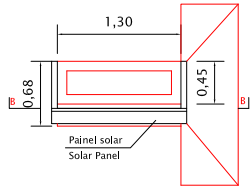
Cisterna 1
Cistern 1



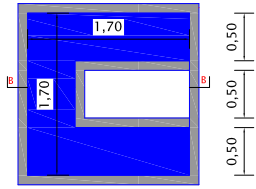
Alçado Oeste
West elevation



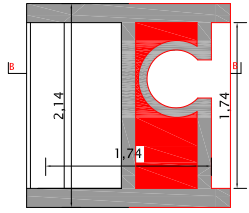




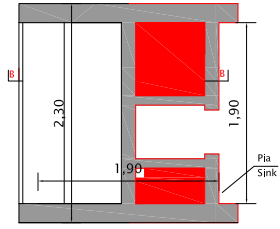
Chaminé
Chimney



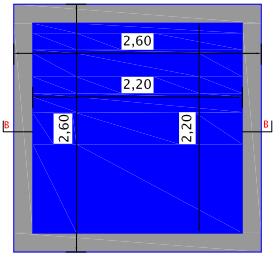
Cisterna 2
Cistern 2



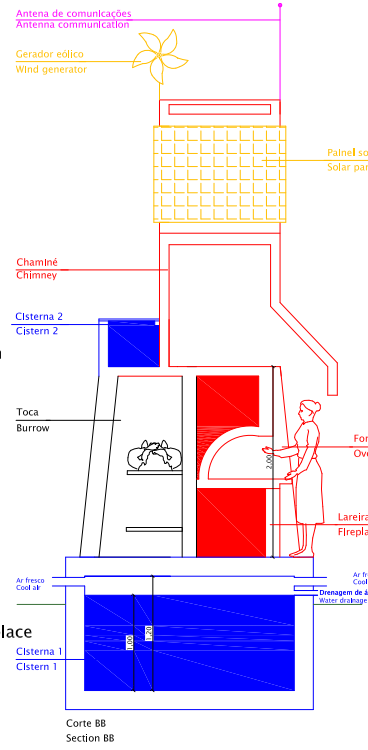
Toca/Lar.Forno
Burrow/Hearth.Oven



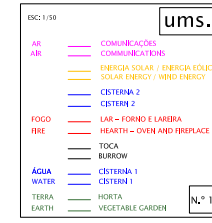
Toca/Lar.Lareira
Burrow/Hearth.Fireplace

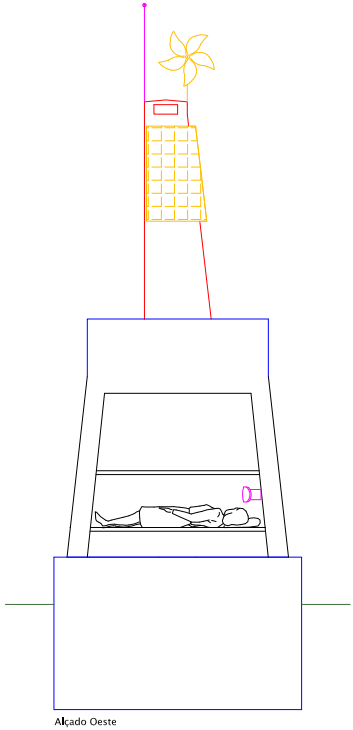


Cisterna 1
Cistern 1



Corte BB
Section BB





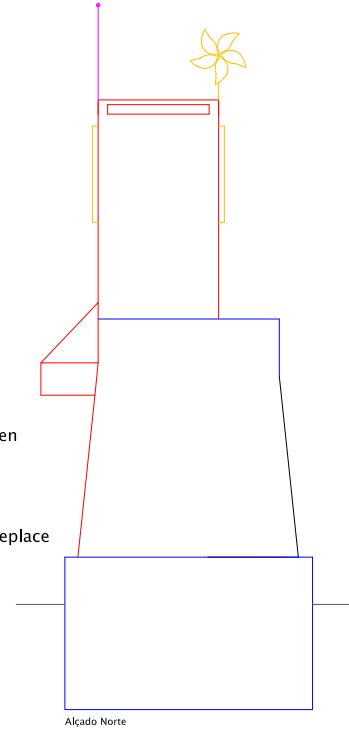
Chaminé
Chimney

Cisterna 2
Cistern 2

Toca/Lar.Forno
Burrow/Hearth.Oven

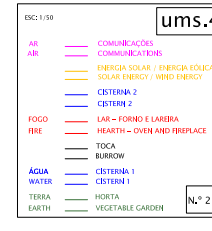
Toca/Lar.Lareira
Burrow/Hearth.Fireplace

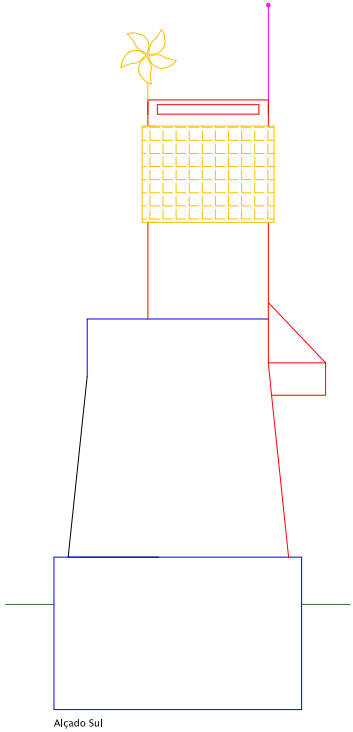
Cisterna 1
Cistern 1



Alçado Oeste
West elevation

Alçado Norte
North elevation





Alçado Sul
South elevation

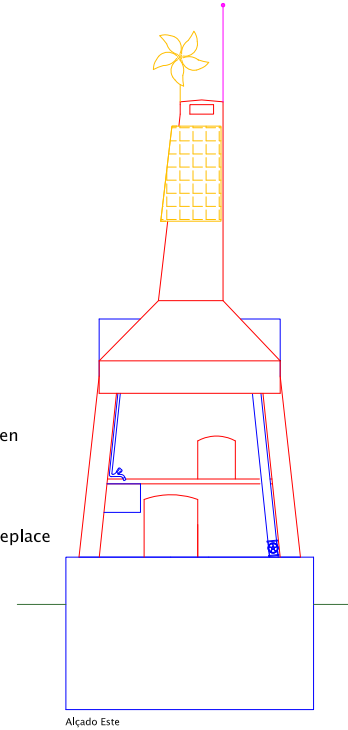
Chaminé
Chimney

Cisterna 2
Cistern 2

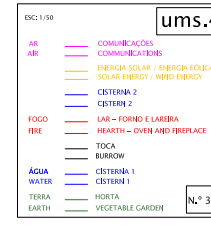
Toca/Lar.Forno
Burrow/Hearth.Oven

Toca/Lar.Lareira
Burrow/Hearth.Fireplace

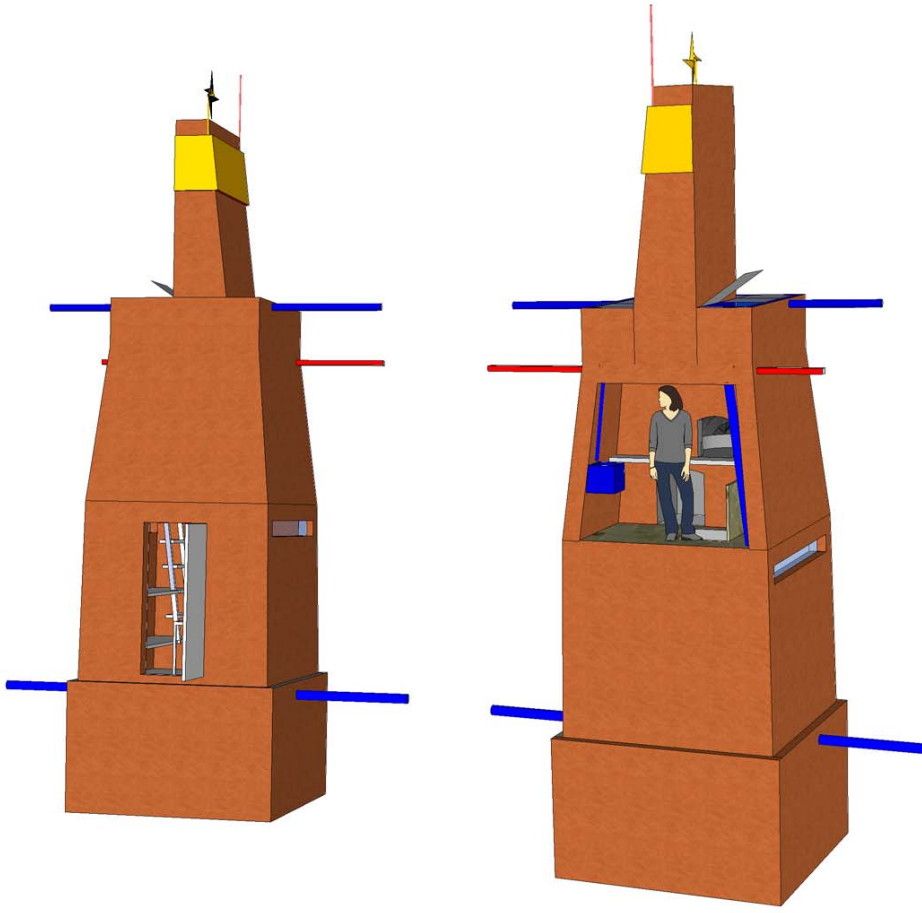
Cisterna 1
Cistern 1

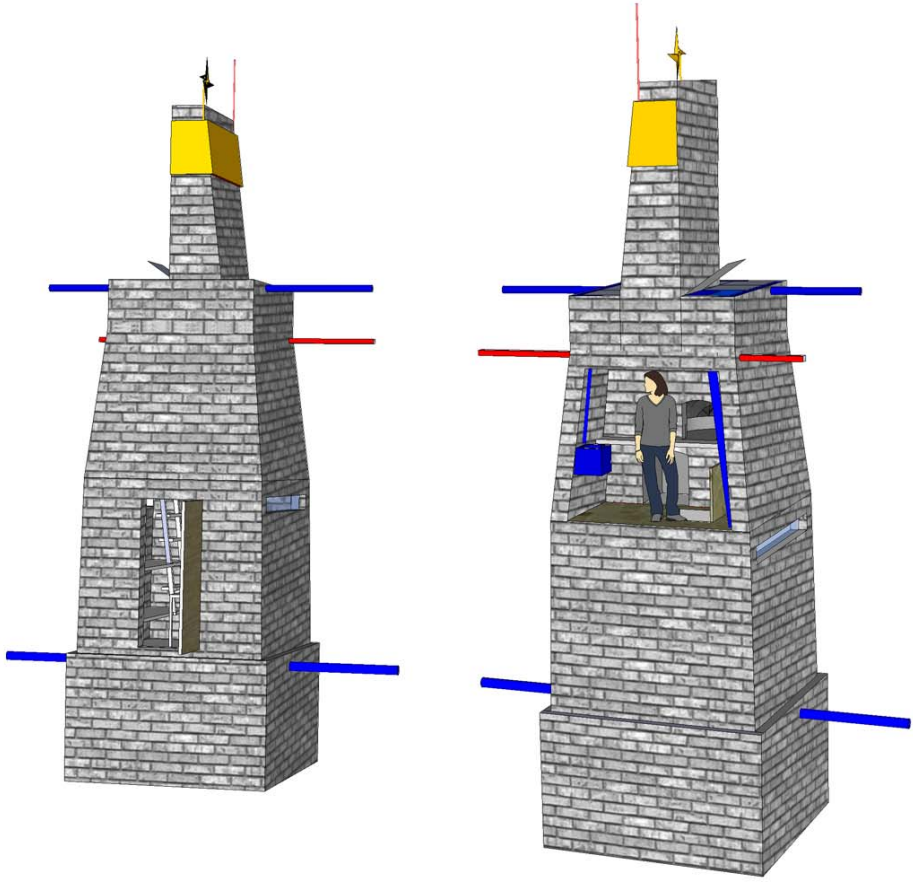


Alçado Este
East elevation

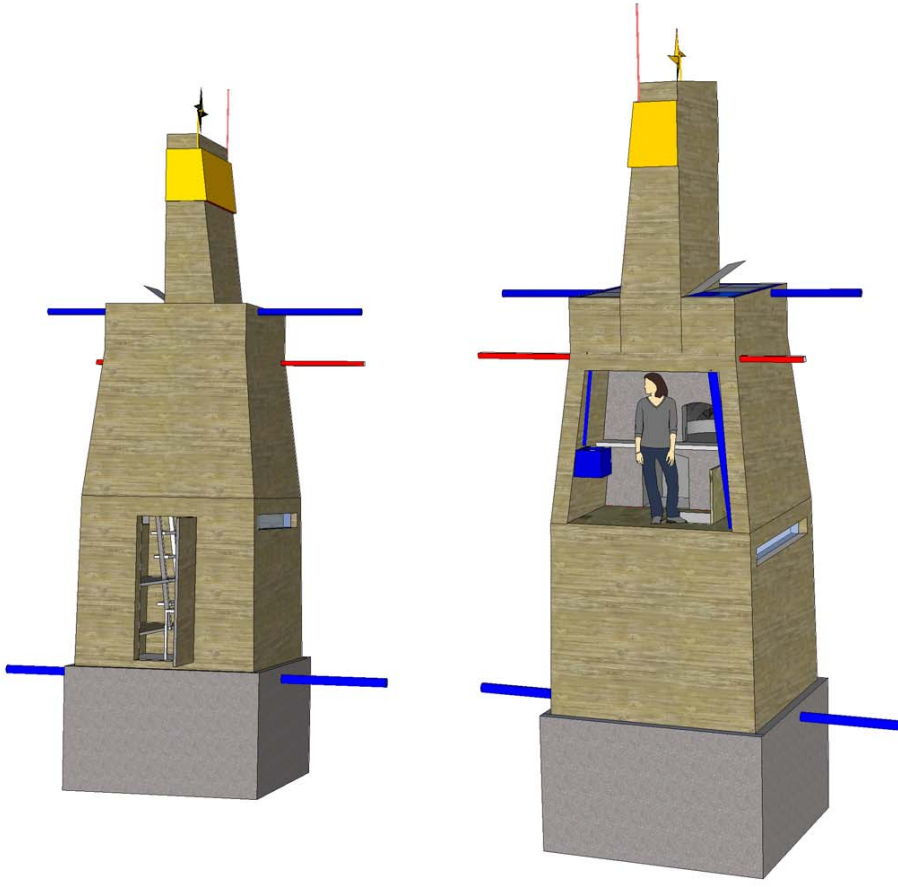


ums.adobe

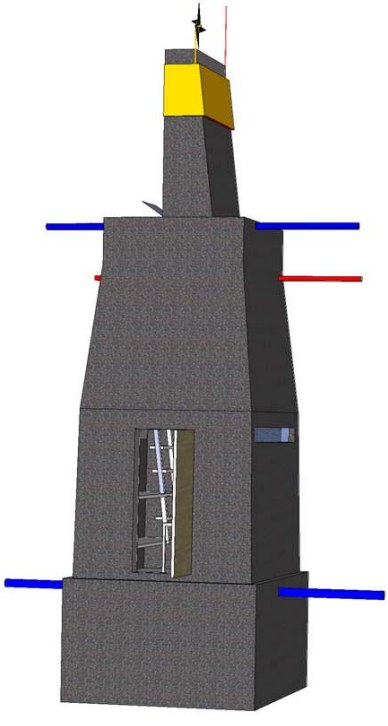


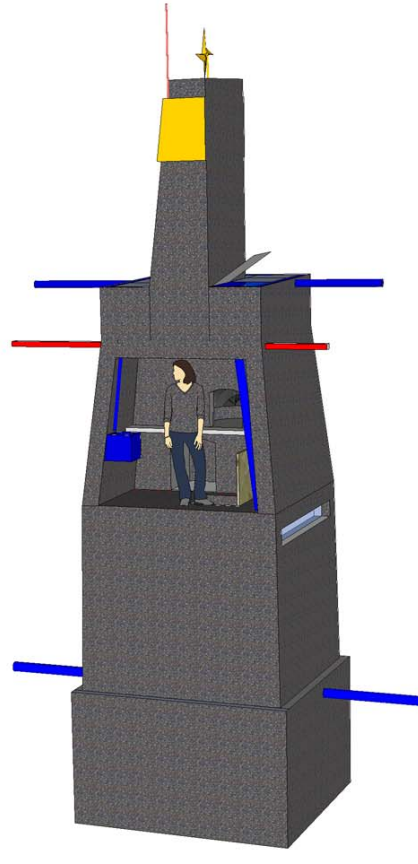


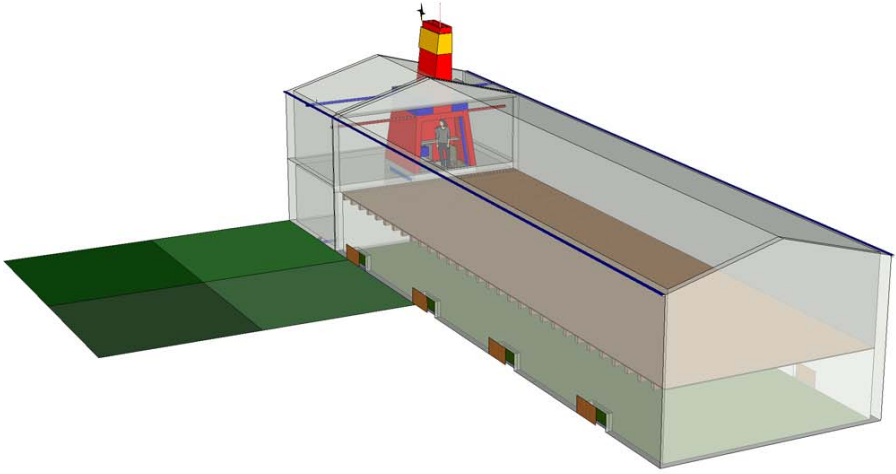
ums.madeira
ums.wood

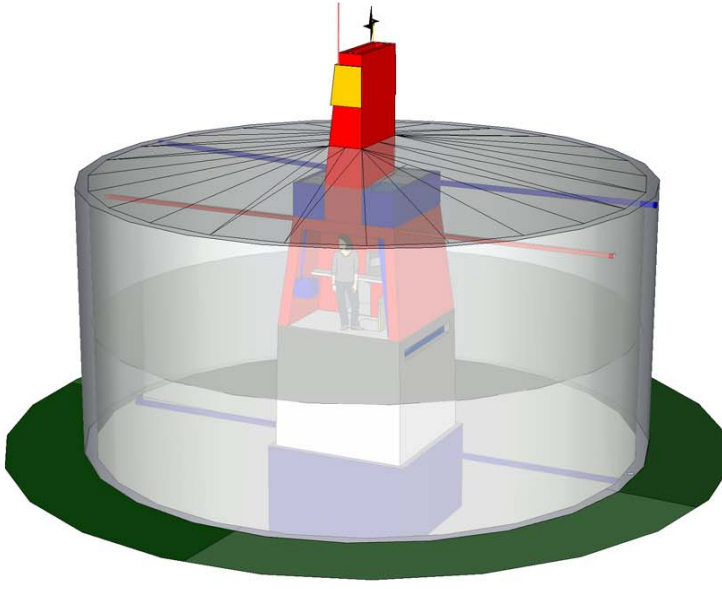


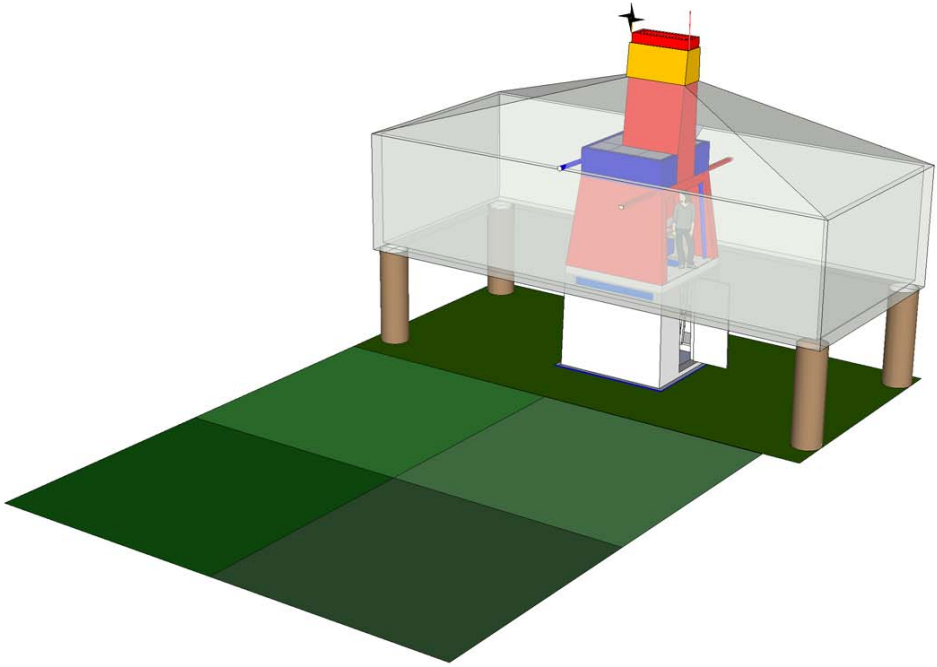
ums.pedra
ums.stone

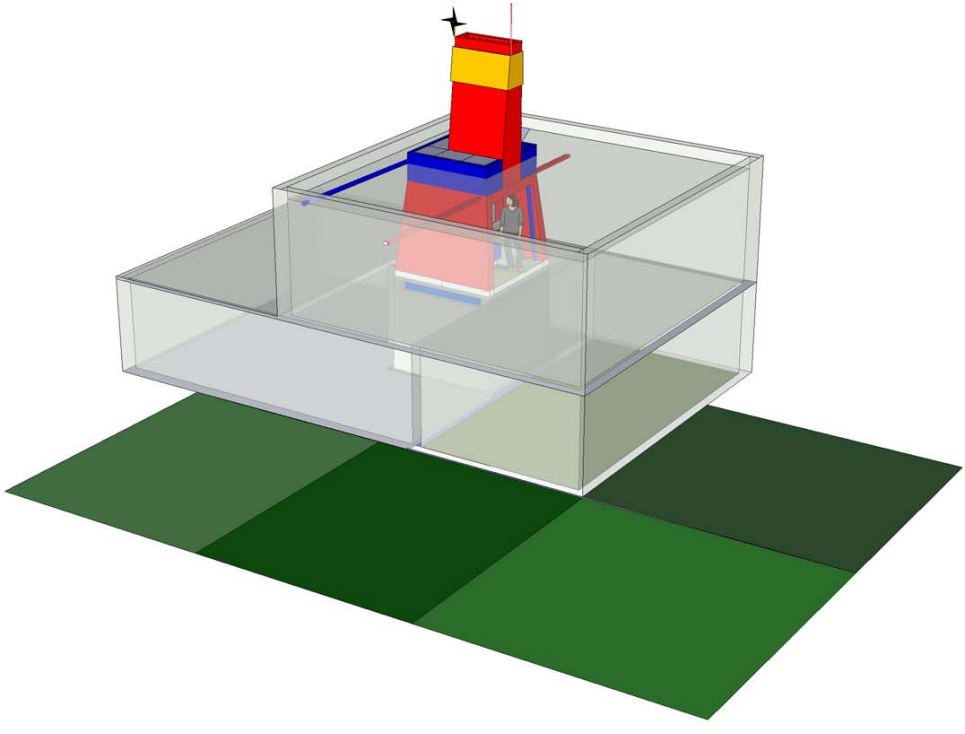


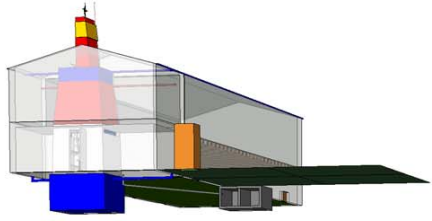


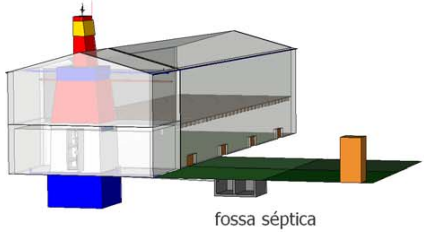




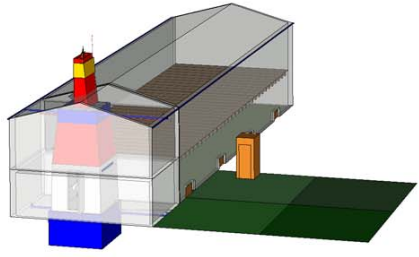


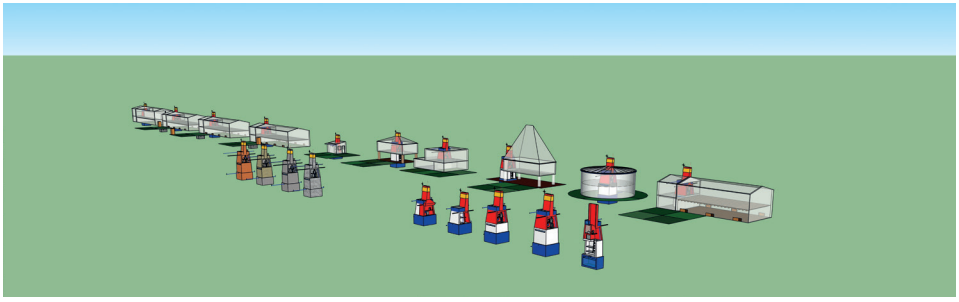


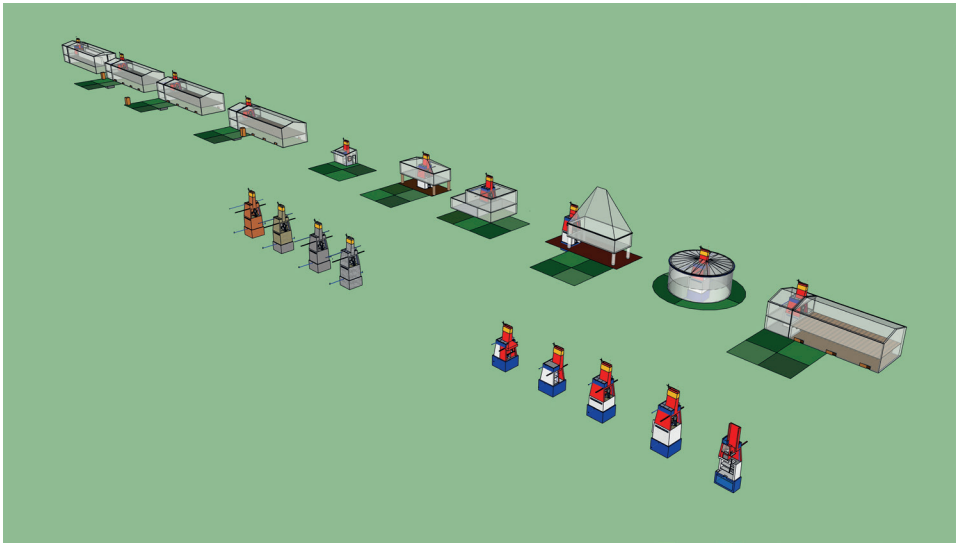


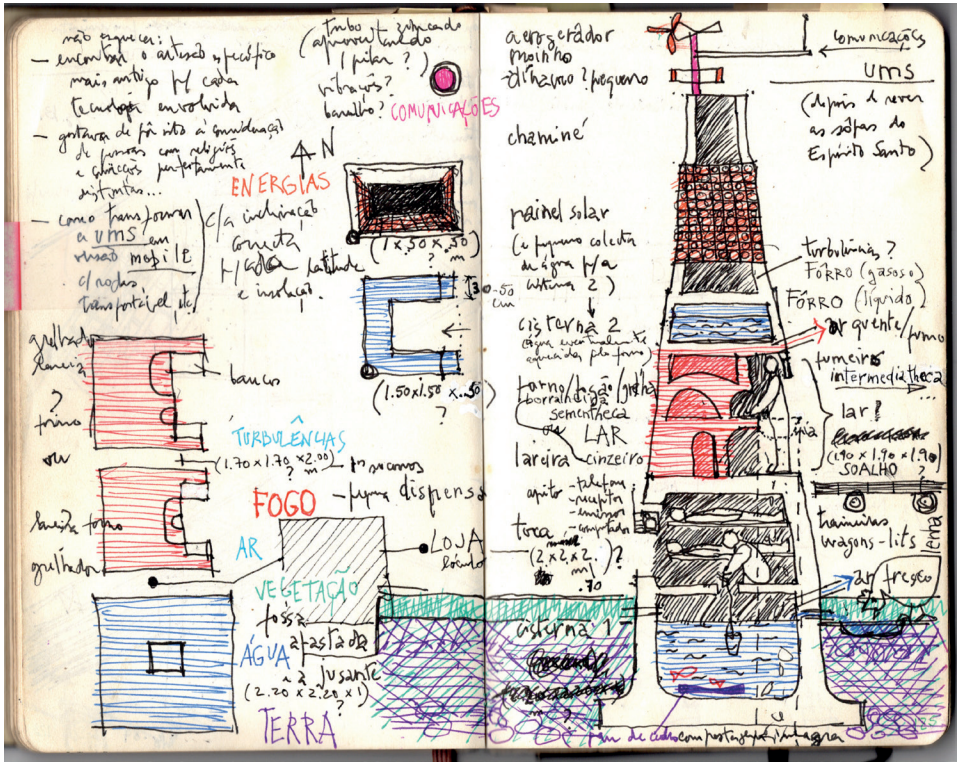


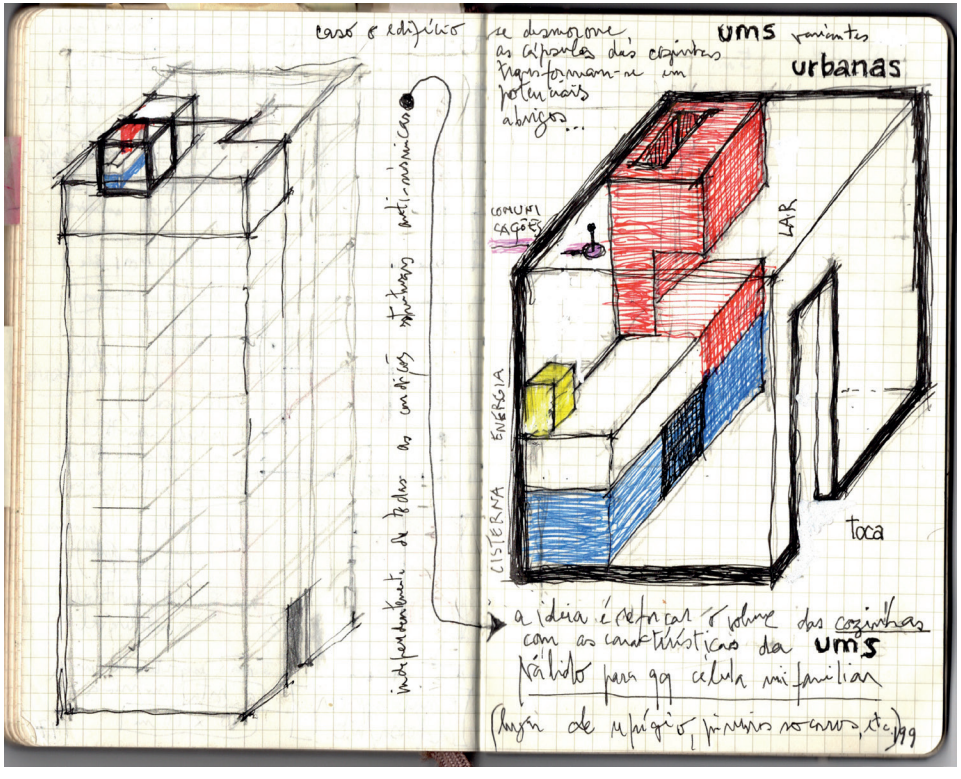
fossa séptica
septic tank - grey water

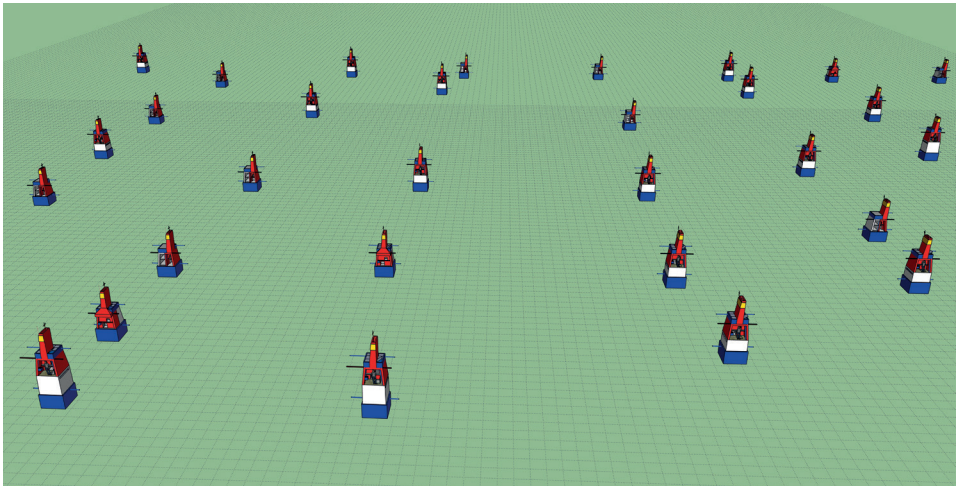







COMUNICAÇÕES
ENERGIAS
TURBULÊNCIAS
FOGO
AR
VEGETAÇÃO
ÁGUA
TERRA
LOJA
LAR
UMS
chaminé
painel solar
cisterna 2
cisterna 1
forno/fogão
lareira
cinzeiro
bancos
FORRO (gasoso)
FORRO (líquido)
SOALHO
trabalhos
lits
fresco


caso 8 edifício
se desmontarmos as cápsulas dos edifícios transformam-se em potenciais abrigos...
UMS variantes urbanas
COMUNI CAÇÕES
LAR
ENERGIA
CISTERNA
toca
a ideia é retirar o volume das cozinhas com as características da UMS
válido para qq célula unifamiliar
(longe de mínimos, primeiros socorros, etc.)



umic - unidade mínima de informação e comunicação

micu - minimum information and communication unit

ums - bibliography

at the scale of the 1:10 model
- thinking about Azores and Cape Verde

Books in chronological order to understand the evolution of the concept.
Including books on architecture and engineering for adults and children to understand the scale of the concept.
All these books are located inside the 1:10 model. Who can not do at 1:1, 1:10 does.

Vicat, L. J., *A practical and scientific treatise on calcareous mortars and cements artificial and natural*, ed. John Weale, High Holborn, 1837 (with notes by J. T. Smith)

Bernan, Walter, *On the history and art of warming and ventilating rooms and buildings*, ed. Geoge Bell, London, 1845

Vicat, L. J., *Nouvelles études sur les pouzzolanes artificielles comparées a la pouzzolane de l'Italie dans leur emploi en eau douce et en eau de mer*, ed. Carilien Goeury et Vor Dalmont, Paris, 1846

Beecher, Catherine E. / Stowe, Harriet Beecher, *The american woman's home, principles of domestic science*, ed. J. B. Ford and Co, Boston, 1869

Joly, V. Ch., *Traité pratique du chauffage, de la ventilation et de la distribuition des eaux (…)*, ed. J. Baudry, Paris, 1873 (2ª ed.)

Leitão, Luiz Augusto, *Curso elementar de construcções*, ed. Imprensa Nacional, Lisboa, 1896

Neves, J. da P. Castanheira das, *Subsídios para o estudo das pozzolanas e sua applicação nas construcções*, ed. Imprensa Nacional, Lisboa, 1907

Ferreira, C. A. Pinto, *Manual de noções elementares de technologia para uso dos alumnos do 1º anno da Escola de Instrucção Primaria Rodrigues Sampaio e em geral para uso da mocidade que se dedica á industria*, ed. António Maria Pereira, Lisboa, 1907 (2ª ed.)

Teige, Karel, *The minimum dwelling*, ed. MIT, Cambridge, 2002 (tradução do original checo, 1932)

Potter, Margaret / Potter, Alexander, *Houses*, ed. John Murray, London, 1948

Buchsbaum, Ralph, *Animals without backbones, an introduction to the invertebrates*, ed. University of Chicago Press, Chicago, 1948 (2ª ed.)

Potter, Margaret / Potter, Alexander, *Interiors*, ed. John Murray, London, 1957

Teixeira, A. J. da Silva / Barbosa, L. A. Grandvaux, *A agricultura do Arquipélago de Cabo Verde*, ed. Ministério do Ultramar, Lisboa, 1958

Wright, Lawrence, *Clean and decent, the fascinating history of the bathroom and the water closet*, ed. Viking Press, New York, 1960

Oliveira, Ernesto Veiga de / Galhano, Fernando, *Arquitectura, capítulo em A arte popular em Portugal*, ed. Verbo, Lisboa, (1959-60)

Ribeiro, Orlando, *A ilha do Fogo e as suas erupções*, ed. Junta de Investigações do Ultramar, Lisboa, 1960 (2ª ed.)

AAVV, *Arquitectura popular em Portugal*, ed. Sindicato Nacional dos Arquitectos, Lisboa, 1961

Krüger, Fritz, *El mobiliario popular en los países románicos*, ed. Faculdade de Letras da Universidade de Coimbra, Coimbra, 1963

Wright, Lawrence, *Home fires burning, the history of domestic heating and cooking*, ed. Routledge Kegan, London, 1964

Engel, Heino, *Structure systems/Tragersysteme*, ed. DVA, Stuttgart, 1967

Oliveira, Ernesto Veiga de / Galhano, Fernando / Pereira, Benjamin, *Construções primitivas em Portugal*, ed. Instituto de Alta Cultura / Centro de Estudos de Etnologia, Lisboa, 1969

Fathy, Hassan, *Gourna, a tale of two villages*, ed. Ministry of Culture, Cairo, 1969

Portas, Nuno, *Funções e exigências de áreas da habitação*, ed. MOP/LNEC, Lisboa, 1969

Gibson, Ulric P. / Singer, Rexford D., *Water well manual*, ed. Premier Press, Berkeley, 1971

Kahn, Lloyd (ed.), *Shelter*, ed. Shelter Publications, Bolinas, 1973

Macaulay, David, *Cathedral, the story of its construction*, ed. Houghton Mifflin, Boston, 1973

Walker, Les / Milstein, Jeff, *Designing houses, an illustrated guide*, ed. The Overlook Press, Woodstock, 1976

Alexander, Christopher / Ishikawa, Sara / Silverstein, Murray, *Pattern Language*, ed. Oxford University Press, New York, 1977

Walker, Les, *Housebuilding for children*, ed. The Overlook Press, Woodstock, 1977

Macaulay, David, *Unbuilding*, ed. Houghton Mifflin, Boston, 1980

Sena, António, *Por uma arquitectura discreta*, in Revista Arquitectura, Lisboa, Julho / Agosto, 1980

Allen, Edward, *How buildings work, the natural order of architecture*, ed. Oxford University Press, New York, 1980

Klein, Alexander, *Vivienda minima 1906-1957*, ed. Gustavo Gili, Barcelona, 1980

Machado, José Luís Pinto, *Habitação rural*, ed. Instituto Fontes Pereira de Melo, Lisboa, 1981

Arnold, Christopher / Reitherman, Robert, *Building construction and seismic design*, ed. J. Wiley, New York, 1982

Beall, Christine, *Masonry design and detailing*, ed. Prentice Hall, New Jersey, 1984

Lyle, David, *The book of masonry stoves*, ed. Brich House Publishing, Andover, 1984

Robbins, Ken, *Building a house*, ed. Four Winds Press, New York, 1984

Pacey, A. / Cullis, A., *Rainwater harvesting*, ed. ITDG, London, 2002 (1986)

Macaulay, David, *The way things work*, ed. Dorling Kindersley, London, 1988

Van Langen, Johan, *Cantos del arquitecto descalzo*, ed. Libros del Rincon/SEP, Mexico, 1991

AAVV, *Wood reference handbook*, ed. Canadian Wood Council/Conseil Canadien du Bois, Ottawa, 1991

Villanova, Roselyne de / Leite, Carolina / Raposo, Isabel, *Casas de sonhos*, ed. Salamandra, Lisboa, 1995

Van der Meer, Ron / Sudjic, Deyan, *The architecture pack*, ed. Alfred Knopf, New York, 1997

AAVV / Oliver, Paul (ed.), *Encyclopedia of vernacular architecture of the world*, ed. Cambridge University Press, Cambridge, 1997

AAVV, *Diálogos de edificação*, ed. CRAT – Centro Regional de Artes Tradicionais, Porto, 1998

Carter, David A. / Diaz, James, *The elements of pop-up*, ed. Simon and Schuster, New York, 1999

Wing, Daniel / Scott, Alan, *The bread builders, hearth loaves and masonry ovens*, ed. Chelsea Green, Vermont, 1999

Jenkins, Joseph, *The humanure handbook*, ed. Jenkins Publishing, Grove City, 1999 (3ª ed.)

Allen, Edward, *Fundamentals of building construction*, ed. J. Wiley, New York, 1999 (3ª ed.)

AAVV, *Arquitectura popular dos Açores*, ed. Ordem dos Arquitectos, Lisboa, s/d (2000)

AAVV, *Lajes Pico, inventário do património imóvel dos Açores*, ed. DRC/IAC/CML, s/l, 2000

Lopes, Leão, *Manual básico de construção*, ed. Ministério das Infraestruturas e da Habitação, Praia, 2001

Mestre, Victor, *Arquitectura popular da Madeira*, ed. Argumentum, Lisboa, s/d (2001-pref. ou 2002- depósito legal?)

Davis, Jan / Lambert, Robert, *Engineering in emergencies*, ed. Practical Action, Warwickshire, 2002 (2ª ed.)

Gould, J. / Nissen-Petersen, E., *Rainwater catchment systems*, ed. ITDG, London, 2003 (1999)

Jeuland, François-Xavier, *La maison communicante*, ed. Eyrolles, Paris, 2005

Bedford, Allan, *The unofficial Lego builder's guide*, ed. No Starch Press, San Francisco, 2005

Caney, Steven, *Ultimate building book*, ed. Running Press, Philadelphia, 2006

Vellinga, Marcel / Oliver, Paul / Bridge, Alexander, *Atlas of vernacular architecture of the world*, ed. Routledge, Abingdon, 2007

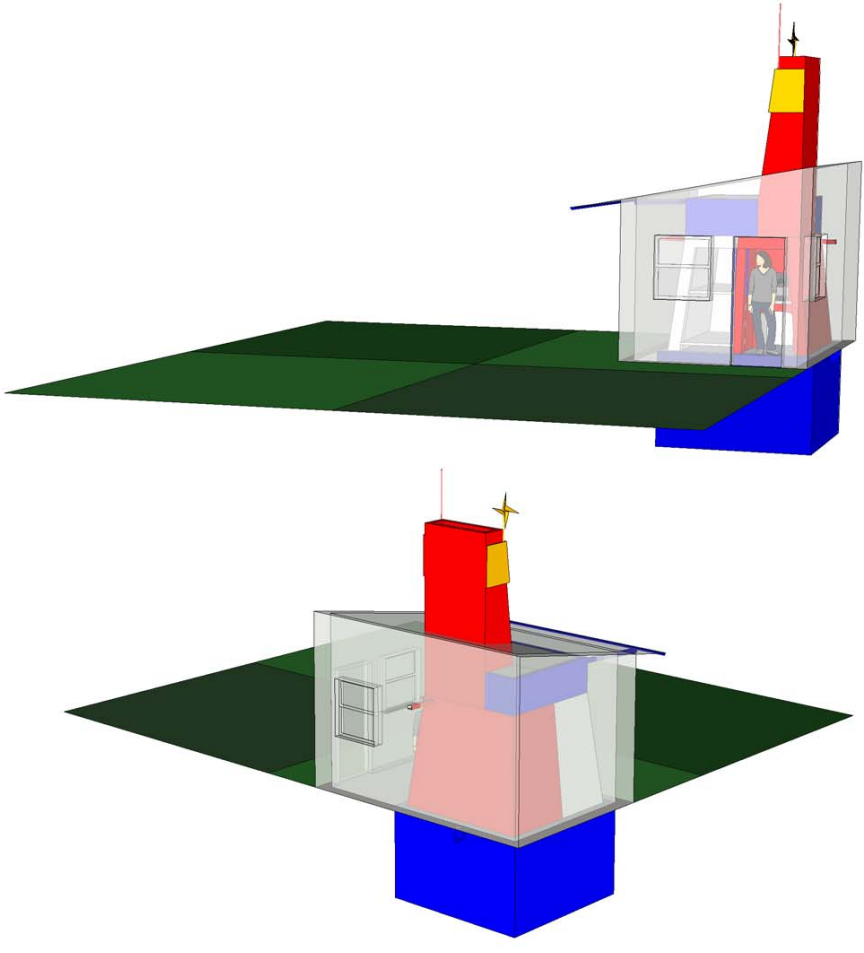
Hall, David / Altern, Zeynep F., *C. Elegans Atlas*, ed. Cold Spring Harbor Laboratory Press, New York, 2008

Riley, Christopher / Dolling, Phil, *Apollo 11 owner's workshop manual*, ed. Haynes, Somerset, 2009

Shafer, Jay, *The small house book*, ed. Tumbleweed Tiny House, Boyes Hot Springs, 2009

Young, Amanda, *Spacesuits*, ed. Smithsonian National Air Museum / PowerHouse Books, Boston, 2009

Macaulay, David, *Built to last*, ed. Houghton Mifflin, Boston, 2010

(bibliography collected in May 2011, updated December 2011)

António Sena